



## **Starter Research Fat and Oil for Calf Feeds**

### **Summary**

Addition of 2% animal fat to a calf starter did not improve calf performance. Addition of 2% soy oil reduced diet digestibility, intake, and ADG.

### **Previous Research with Linolenic Acid in Calves**

The typical calf diet is not formulated with fatty acids in mind, despite the fact that most every diet is deficient in linolenic acid ( $C_{18:3}$ ), an essential fatty acid. In five of five controlled trials, average daily gain was increased when linolenic acid was supplemented to overcome the deficiency. At the optimum supplementation rate of linolenic acid, the increase in average daily gain over the control averaged 8%. In 3 of the 5 trials, feed efficiency was improved when linolenic acid was supplemented, while feed intake was not changed in any trial.

Supplementation of calf starter and grower diets with lard, tallow, soy oil, animal/vegetable fat blends, etc. is somewhat typical to improve the wet appearance of the textured feed or to make a pellet slip through the pellet die more efficiently. Three trials were conducted to determine the effect of adding fat or oil to calf starter diets.

### **Previous Research with Fat and Oil**

In diets deficient in linolenic acid, starter diets supplemented with different fats and oils have typically reported no increase in ADG. Most trials reported a reduction in starter intake.

### **Current Trials at Akey**

In Trial 1, supplementing 2% soy oil to a textured calf starter deficient in linolenic acid reduced the digestion of the diet, reduced starter intake, and reduced ADG. Supplementing 2% animal fat did not change digestion, intake, or ADG. See Table 1 for details. Note the elevated linoleic ( $C_{18:2}$ ) concentration in the diet with added soy oil. This is the largest difference among the fatty acids of the diets.

In Trial 2, supplementing 2% soy oil to a textured calf starter reduced starter intake and ADG of calves when the diet was supplemented with and adequate in linolenic acid. Additionally, adding 2% soy oil reduced intake and ADG of calves when the diet was not supplemented with and deficient in linolenic acid. See Table 2 for details.

### **Recommendations from the Research**

Adding fat or oil to the diet is not suggested. If fat or oil is needed to reduce dust or add to the appearance of moisture in the feed, 2% soy oil is not recommended. Because 2% animal fat did not reduce calf performance, animal fat would be a better choice.

**Table 1. Trial 1.****Effect of oil/fat, no added C18:3**

Item	A) 0% fat/oil	B) 2% Animal fat	C) 2% Soy oil
Fat, % of diet as-fed	3.65	5.29	5.31
C <sub>16:0</sub> , % of diet as-fed	0.57	0.98	0.74
C <sub>16:1</sub> , % of diet as-fed	< 0.01	0.07	0.01
C <sub>18:0</sub> , % of diet as-fed	0.08	0.39	0.15
C <sub>18:1 trans</sub> , % of diet as-fed	< 0.01	0.07	< 0.01
C <sub>18:1 cis</sub> , % of diet as-fed	0.91	1.62	1.29
C <sub>18:2</sub> , % of diet as-fed	1.82	1.80	<u>2.71</u>
C <sub>18:3</sub> , % of diet as-fed	0.11	0.12	<u>0.26</u>
C <sub>18:2</sub> to C <sub>18:3</sub> dietary ratio	16.5	15.0	10.4
0-56 d ADG, lb/day	1.24	1.21	<b>1.15</b>
0-56 d starter intake, lb/day	2.06	2.03	<b>1.94</b>
Digestibility of DM, %	80.2	80.8	<b>74.7</b>
Digestibility of OM, %	80.9	81.7	<b>75.9</b>
Digestibility of CP, %	75.4	76.2	<b>68.6</b>

**Table 2. Trial 2****Effect of 2% soy oil**

Item	A) added C18:3, 0% soy oil	B) added C18:3, 2.0% soy oil	C) 0% C18:3, 0% soy oil
Fat, % of diet as-fed	3.58	5.79	3.73
C <sub>18:2</sub> , % of diet as-fed	2.02	3.79	2.04
C <sub>18:3</sub> , % of diet as-fed	0.26	0.53	0.14
C <sub>18:2</sub> to C <sub>18:3</sub> dietary ratio	7.77	7.15	14.57
0-56 d ADG, lb/day	<b>1.23</b>	<b>1.12</b>	<b>1.07</b>
0-56 d starter intake, lb/day	<b>1.86</b>	<b>1.73</b>	<b>1.65</b>